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ABSTRACT

This paper examines the Bank Street College of Education's efforts to infuse technology into all aspects of graduate teacher education. Entitled Project EXPERT (Expanding Educational Repertoire through Technology), the effort called for graduate school faculty to learn to use technology in their own classrooms and to redesign their courses, students' supervised fieldwork experiences, and students' culminating projects to effectively use technology. Project goals were to prepare classroom teachers to use technology wisely with students and to provide leadership in the area of instructional technology and assessment. Project EXPERT was a whole-school model for technology integration in the context of curricular reform. This paper describes the development and first-year implementation of Project EXPERT, noting lessons learned (e.g., curriculum reform and technology integration seem ideally matched in theory, but can present problems in practice; online discussion forums were the first technology to interest faculty; and for many faculty, curricular reform was not originally a matter of changing teaching practice, but rather of including a wider set of perspectives in their courses, particularly an emphasis on inclusion, diversity, and use of the arts). Revisions made after the first year focused on faculty training, curricular redesign, and K-12 teacher involvement. (SM)

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Integrating Technology into Teacher Education: A Review of Bank Street's Project EXPERT

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Preparing technology-proficient educators should be an important goal for all teacher preparation programs. Over the past few years, schools, colleges, and departments of education have been developing various approaches to meet this goal. This article looks at one college's efforts to integrate technology into a teacher education program. Readers are encouraged to submit questions or share their own experiences in integrating technology in teacher education by emailing the ERIC Web master, (eric@aacte.org).

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Introduction

In 1998, Bank Street College of Education undertook a program of systematic integration of technology into all aspects of its graduate teacher education program. Entitled Project EXPERT (Expanding Educational Repertoire through Technology), the program called for graduate school faculty to learn to use technology as a tool in their own classrooms and to redesign their courses, supervised fieldwork experiences, and students' culminating projects to effectively use technology. The goals of Project EXPERT were to prepare classroom teachers to use technology wisely with their students and to provide leadership in their schools in the area of instructional technology and assessment. However, technology in itself was not the ultimate goal; it was used to serve the College's broader mission of preparing students to teach in diverse and inclusive settings. Unlike other models for technology integration that consisted primarily of supporting "islands of innovation"—individual faculty members who experiment with integrating technology into a specific course—Bank Street's Project EXPERT was a whole-school model for technology integration in the context of curricular reform. This article reviews the development and implementation of the Project and highlights lessons learned.

Program Development

Project EXPERT grew out of a two-year curriculum revision process in Bank Street's elementary education degree program. Faculty voted to reorganize a number of courses into three, year-long strands—Human Development, Social Foundations, and Curriculum--and to begin using a cohort model of advisement that would allow students access to each other's expertise and experience.

Building Consensus

To move an entire institution in a new direction requires a shared vision built on consensus about why change is needed. Building consensus among the Bank Street faculty before embarking on the actual work of Project EXPERT was an important step for Project leaders. Communications with faculty emphasized that curriculum reform—designed to prepare students to teach in diverse and inclusive settings--was driving the process of change, and technology was a tool in the process. By tying technology integration to the more comprehensive theme of curriculum design, as well as offering additional compensation to Project participants, Project leaders were able to recruit leading faculty members--those responsible for the conceptual redesign of core courses—onto the Project team. The presence of faculty leaders on the Project team lent credibility to the process of technology integration.

Program Objectives

During the process of consensus building, Bank Street faculty had established an agenda for strengthening their work in teacher preparation. Central to their interests were: 1) broader preparation of teachers; 2) infusion of technology into courses; 3) infusion of the arts into courses to support the development of a broader pedagogical repertoire in teachers. Based on this agenda, Project EXPERT's primary objectives were defined as:

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1. To infuse a sophisticated use of technology into all coursework in the three new strands and the advising cohort groups.
2. To increase communication between graduate faculty, students, and cooperating teachers during supervised fieldwork.
3. To engage public and private school teachers in the redesign of courses and to align their practice with the work of Project EXPERT, so that they might provide "examples in action" to graduate students.
4. To infuse aesthetic education as well as technology into the redesign of courses so that emerging teachers understand the importance of the arts as tools to expand their pedagogical repertoire.
5. To share findings from this project with the national education community to promote a better understanding of innovative, appropriate uses of technology developed in teacher and leadership education.

First-Year Program Implementation

To achieve the program's objectives, the following structures and systems were put into place.

The technological infrastructure was upgraded. Separate funding had allowed the college to install two new computer labs and increase the staffing of the technical support group. A new e-mail system was introduced, and many faculty received new computers.

Technology consultants were identified. The Center for Children and Technology of the Educational Development Corporation (CCT) was selected as technology consultant for the Project. CCT had the necessary skills, shared Bank Street's philosophical approaches to teaching and learning, and had a deep understanding of the institution.

Teams, called "strand groups," were organized and group meetings were held. Graduate faculty, in partnership with CCT, the Bank Street School for Children, public school teachers from the College's partner school districts, and the College's library staff, met weekly in each of the three course strands to discuss, debate, and design these new year-long courses. Each strand group contained members of the Bilingual and Special Education faculties. They were to provide the expertise necessary to insure that these issues were addressed in each strand. In addition, a partnership with the Lincoln Center (Arts) Institute was initiated, which included their participation in the Curriculum Strand.

In the Cohort Advising Group, five student teaching supervisors met bi-weekly. The advisors brought 30 students together in a cohort. Divided into five smaller groups for weekly meetings with their advisor, the students met every six weeks to learn from each other about the issues associated with their diverse programmatic specialties. Through actual and virtual meetings, they were able to talk with each other about their respective areas of experience and expertise.

A virtual workplace was adopted. Faculty and students used an electronic workplace (Hypernews) in three ways:

1. To introduce new issues. As new issues arose, they were posted in the "virtual workplace" for later discussion.
2. Threaded conversations. These were often continuations of discussions addressed during the "in person" meetings.
3. Hyperlinks. Faculty, and eventually students, were able to reference a piece of literature or other information on the World Wide Web without any special programming. The Hypernews Web site permitted this seamless creation of hyperlinks, and thus access to information on the Web, allowing faculty to begin compiling "webliographies" in addition to regular course bibliographies.

An internal review process was established. In order to insure the cross-fertilization of ideas and approaches, the lead faculty member and CCT facilitator from each group met monthly with the Project Director and the Bank Street instructional technology coordinator to discuss progress and problems.

An external review process was established. Three experts from outside the college community were designated as "critical friends." They were: Jim Pellegrino, dean of Vanderbilt University's Peabody School of Education and a principal architect of that school's technology program; Wilma Smith, a school reformer with experience in K-12 and higher education reform; and Bill Ayers, an alumnus of Bank Street College with a background in progressive education and school reform.

This group spent a day at Bank Street to learn about the Project and offer constructive criticisms. One critical friend joined each of the EXPERT groups for a regularly-scheduled meeting in the morning. During lunch they provided feedback to their group. Later in the day, the critical friends met with each other to discuss what they saw and to frame their summary recommendations to the leadership group.

Lessons Learned

While the Foundations Strand radically altered the pedagogy and content of their course, the other three strand groups met with frustration. Curriculum reform and technology integration seem ideally matched in theory, but can present problems in practice. Technologies can be used to make teaching and learning processes more efficient or available without essentially altering the content. Putting a syllabus on the Web, for instance, makes the syllabus more accessible but does not change the course itself. The capacity to browse through the syllabi of all courses offered during a semester might provide members of the college community with a clearer picture of what students are being offered and might support the faculty in student advising, but it does nothing to change the curriculum. Altering pedagogical practice, on the other hand, is a far more complex undertaking. It requires the ability to do something in a new way, relinquishing previous expertise and control while learning new techniques, exploring new consequences of new approaches and developing new criteria for determining their success.

Take, for example, a faculty member who has relied on traditional lecture and demonstration methods to teach and has kept tight control over class discussions, making sure they are appropriate to his or her teaching goals and using student comments as jumping off points for continued lecturing. This teacher may be interested in using technology to "open up" discussion outside of class and would most likely find the use of an on-line discussion forum a good venue for such reform. Students could talk as much and as often as they wanted to in that forum. Facilitating such a discussion to make sure that it is genuinely useful to students and does not dissipate after an initial flurry of experimentation is not a trivial matter, however. The teacher would have to learn new ways to relate to student conversation, to probe and support, to ask challenging and evocative questions, and to comment rather than critique by way of response. If the technology is easy to learn, experimenting with such a medium can lead to curricular reform. If the technology is difficult to master, the faculty member is not likely to persist, since the effort required to learn the technology would detract from the effort needed to learn how to facilitate more open discussions.

Bank Street faculty are generally well practiced in facilitating rich, wide-ranging, reflective discussions among their students. Thus, it was not surprising that on-line discussion forums were the first technology to interest the faculty. This technology supports a major component of the Bank Street curriculum, but it does not constitute a change in practice for most of the participants. It is primarily an opportunity for them to become acquainted with technology itself, but the pedagogical value of using these tools has not yet been fully explored by the EXPERT faculty.

For many of the Bank Street faculty, curricular reform was not originally a matter of changing their teaching practice but rather of including a wider set of perspectives in their courses, particularly an emphasis on inclusion, diversity and the use of the arts. The Internet provided them with an opportunity to find many new resources to enrich their courses. But there is a limit to how much any single course can include. Making decisions about what to include and what to leave out can point the way toward a need for changing the pedagogical practices themselves, letting go of a desire to cover a wide spectrum of issues in favor of more in-depth research by students. Faculty members who were grappling with such issues of curriculum reform in the EXPERT strands found it very difficult to integrate technology meaningfully into that aspect of the course re-design. They were excited by the prospect for new materials and they saw how the availability of such new resources could support in-depth research by students, but they were too unfamiliar with technology itself to be able to imagine how it might support a new way of teaching. They were being asked to reconceptualize course content and to imagine new ways of learning and teaching at the same time as they were being expected to learn new technical skills and new habits of thinking about the organization of information, about the value of various media and about the function of different kinds of communication possibilities. It was too much at once.

Bank Street's educational philosophy is based on a notion of students constructing their own knowledge through carefully scaffolded learning opportunities. What is true for K-12 students and for graduate students is also true for faculty. The scaffolding for their learning of new technology-related skills and ways of thinking could not come from the technology consultants, either in-house or CCT. It had to come from the faculty's own expertise. In this case, scaffolding had to consist of enabling faculty to practice new technological skills in the context of established and fully familiar teaching practices. Only by supporting with new technologies what they already knew how to do well could the potential for new uses be recognized. The Project had to relinquish the notion that technology could support the inclusion of the new perspectives (diversity and the arts) and be satisfied with the goal of using technology to support existing practices first. The strands that were least focused on pedagogical reform and most clearly interested in using technology to provide a wider range of resources were more successful in integrating technology into the redesign of their course than the strands that were faced with the need to reform how they teach rather than what they teach.

Regular communications with faculty proved to be a powerful tool for building momentum. Formal presentations to faculty were made about every third month. With each presentation, additional faculty members became more intrigued. At a year-end retreat, faculty, both in and out of the Project, enthusiastically shared their stories of success using the "electronic workplace," Hypernews. The result was an over-enrollment in the second year of the project and the use of the Hypernews tool in nine courses during the first

year of the project. In addition, at least six faculty members added "webliographies" to their courses.

Another aspect that worked well was giving people the time and equipment to successfully use technology. Many faculty admitted that they would not have undertaken the work without the time and compensation built into their regular workload. All faculty involved in EXPERT, in fact, worked well beyond their commitment, and continue to put in extra time finishing up the work in which they had become involved.

Outcomes and Revisions After the First Year

After the first year, Bank Street's model for whole-school technology integration was modified to a "tool infusion" model. It consists of providing broad support for a limited set of technology uses that have been carefully selected to represent a good match with the practices of the Bank Street faculty.

In addition, the goals for the program were redefined. The broad goal of infusing technology into the curriculum proved to be too broad and vague. As the first year came to a close, the project's leadership team, with the help of CCT, proposed to the faculty a goal of graduating students with the following skills:

1. Using the Web as a tool for deepening research and inquiry
2. Using dialogue and exchange tools for engaging student learning
3. Authoring in multi-media in student constructive projects
4. Digital literacy: Finding and evaluating educational software

(See Figure 1.)
In addition, specific changes were made in the areas of faculty training, curricular redesign, and K-12 teacher involvement.

Faculty Training in Technology
A strong system of technical support is needed to enable an entire faculty to integrate technology, over time, into their practice. This became clear to Project leaders as the first year progressed. When individual faculty members experiment, the support needed to scale up technology integration is sometimes difficult to gauge because the pioneering faculty often spend countless private hours teaching themselves how to use the technology of interest to them. It is easy to fall into the trap of expecting other, less technologically inclined faculty to spend their private time learning technical skills, even though, unlike the pioneers, they are not driven by an intrinsic interest in the technology. (NOTE: The Bank Street library staff turned out to be an unexpected mine of help. A librarian was part of each EXPERT group. The librarians gave technical help, searched the Web for resources, and taught faculty how to find their way around the Web.)

To help support faculty in learning about technology, all participating faculty began the second year with an eight-session "hands on" look at selected technological tools. They were given the opportunity to discuss ways that these tools might be used to support teaching and learning. The goal was to provide the faculty with insight into *how* technology might interact with their work. At the same time, faculty began discussing the content they wished to focus on during the year. This helped them define *what* they wished the technology to interact with. After the eight-week course, the staff of CCT made themselves available to the faculty to support follow-up work in technology.

Curricular Redesign
Of the three new curriculum strands, the Social Foundations group had begun the first year with the clearest content goals. Technology integration worked well with this group, and in the second year, this strand was rebuilt into an inquiry-based course with extensive use of the Web as a primary resource. This was a major change in the design of the course. The other two curriculum strands needed time to work out their content goals. In the first year, the technology competed with the content for time and attention rather than supporting the work of the group. In both these groups the development of a technologically rich year-long strand gave way to individual innovations by faculty members in their existing courses.

The advisement group began the first year with a relatively weak commitment to technology. Yet, as the potential of technology became evident, the commitment grew. In spite of limited use in the first year of EXPERT, the Cohort saw a "natural and near-seamless ways to link technologies and advisement."

K-12 Teachers
K-12 teachers were valuable resources in keeping course development realistic. Bank Street wanted to create courses that were grounded in practice and the realities of public school life, and teachers were critical in achieving this objective. Also, the teachers could potentially create classrooms where future students could see the ideas they were learning in classes implemented. But it became clear in the first year that to make teachers part of the process, scheduling and compensation issues had to be addressed. Perhaps more challenging, K-12 teachers needed help in assimilating to the higher education culture. They were initially timid about voicing opinions, particularly if they thought their opinions would be seen as negative. Despite the initial "culture" challenges, the teachers were helpful to the groups. One teacher provided rich case material for use in one of the course strands. Another teacher began to pilot (and model) the use of the Hypernews environment as a way to communicate with parents.

To address the problem with K-12 teachers and culture shock in higher education, three steps were taken in the second year. First, project leaders made the teachers' roles clearer through explicit discussions about their responsibilities and the Project. Teachers were also included in technology immersion and arts immersion seminars with faculty. In addition, faculty were asked to work one-on-one with teachers on technology implementation in the teachers' classrooms.

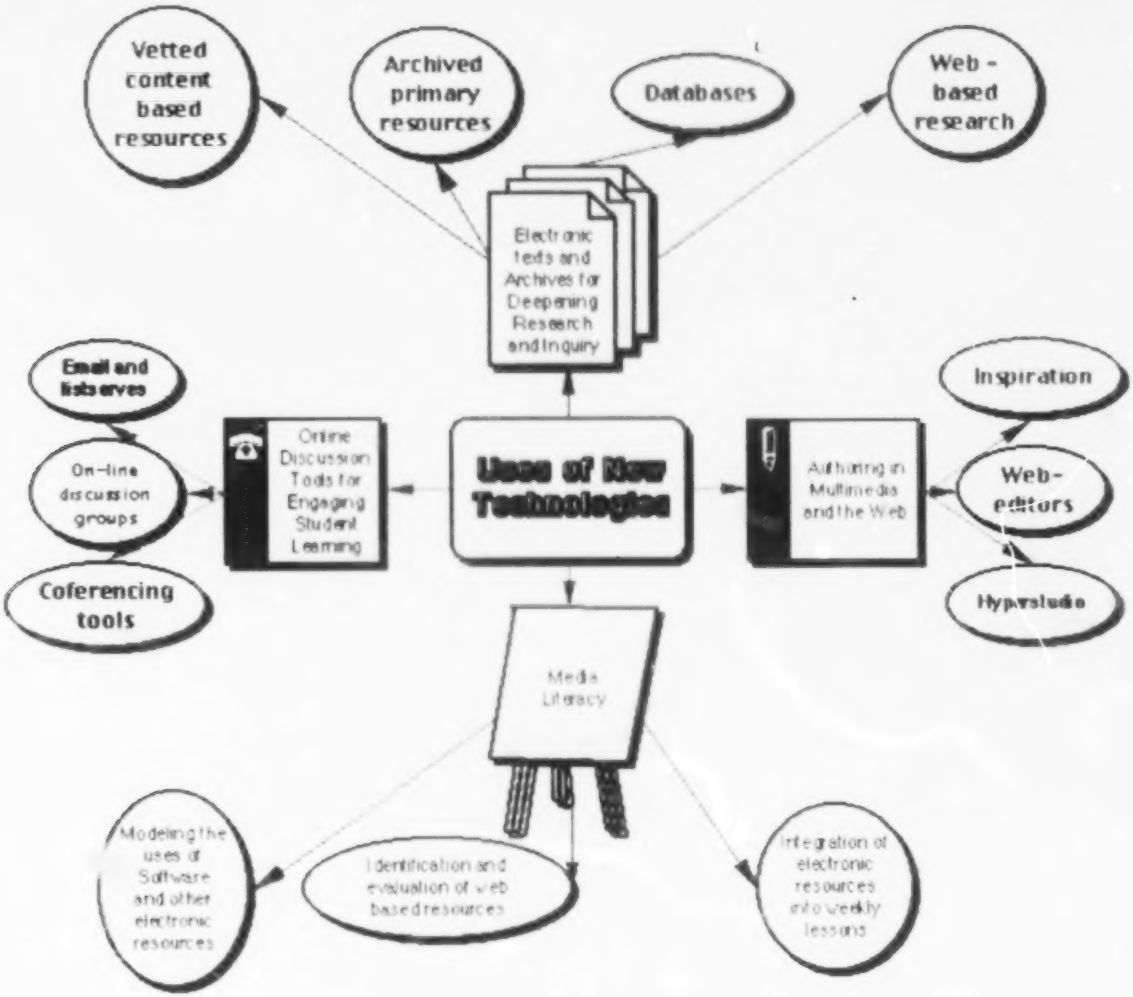
Next Steps

In the second year of Project EXPERT, it became clear that more time and support was needed to continue the work begun. In 1999, the Department of Education awarded a three-year implementation grant under its Preparing Tomorrow's Teachers to Use Technology (PT3) grant program. Entitled Project DEEP (Deepening and Expanding Project EXPERT), the project will continue the work begun by Project EXPERT in instructing new teachers in using technology to meet the diverse needs of learners. To achieve these goals, new courses will be developed, the catalogue and program descriptions will be revised. Project DEEP's goals is to ensure that Bank Street College graduates will be able to:

- Select appropriate electronic resources for use in their classrooms
- Use discussion tools to enhance classroom learning
- Use appropriate authoring tools to assist teachers as they engage children in various disciplines
- Engage children in Web-based inquiries

Conclusion

Prior to Project EXPERT, a long-standing concern at Bank Street College had been that faculty were not convinced that technology would truly provide better learning opportunities for students. The first year of Project EXPERT persuaded many faculty that possibilities for constructive technology integration do exist.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Identification and evaluation of web based resources
Integration of electronic resources into weekly lessons

(figure 1)
Conceived by Bill Tally, The Center for Children and Technology of the Educational Development Center, New York City.

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